

531,009

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



12 APR 2005



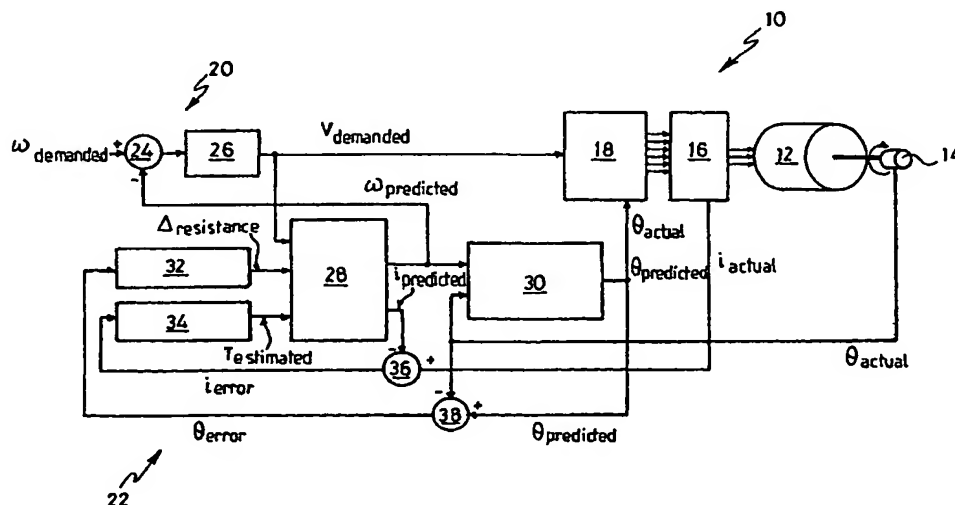
(43) International Publication Date
27 May 2004 (27.05.2004)

PCT

(10) International Publication Number
WO 2004/045061 A1

- (51) International Patent Classification⁷: **H02P 6/08**, 6/16 (74) Agent: **KEITH W NASH & CO**; 90-92 Regent Street, Cambridge CB2 1DP (GB).
- (21) International Application Number: PCT/GB2003/004762 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 6 November 2003 (06.11.2003) (84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 0226317.6 9 November 2002 (09.11.2002) GB
- (71) Applicant (*for all designated States except US*): **CAMBRIDGE CONSULTANTS LIMITED** [GB/GB]; Science Park, Milton Road, Cambridge CB4 0DW (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **GORDON, Benjamin, Morris** [GB/GB]; 95 Fishers Lane, Cherry Hinton, Cambridge CB1 9HL (GB). **BOWYER, Robert, Owen** [GB/GB]; 56 Bartlow Road, Linton, Cambridgeshire CB1 6LY (GB).
- Published:
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: CONTROLLER FOR A SYNCHRONOUS MOTOR



(57) **Abstract:** A controller for a synchronous motor, the controller being operable in use to receive from sensor means coupled to a synchronous motor actual angular displacement signals representative of angular displacements from a reference orientation of a rotor of a synchronous motor, to transmit the actual angular displacement signals to a controllable alternating current (ac) supply for the motor, periodically to measure one or more parameters related to the torque of a synchronous motor, and between transmissions of the actual angular displacement signals, to derive from the actual angular displacement signals and measured parameters at least one estimated angular displacement signal representative of an estimated angular displacement from a reference orientation of a rotor of a synchronous motor, to enable the controller to cause to flow between the supply and a synchronous motor a generally sinusoidal current that is synchronised to the angular displacement of the rotor from the reference orientation.

WO 2004/045061 A1